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DEPARTMENTS.

SOLUTIONS OF PROBLEMS.

ARITHMETIC.

Apropos of the ending of a century, the following is said to have been written on New Year's Day, 1801, by Theodore Dwight (1764—1846), the brother of Timothy Dwight, the distinguished Congregational divine.

"Precisely 12 o'clock last night
The 18th century took its flight.
Full many a calculating head
Has racked its brains, its ink has shed
To prove by metaphysics fine
A hundred means but ninety-nine;
While at their wisdom others wondered,
But took one more to make a hundred.
Strange at the 18th century's close
While light in beams effulgent glows,
When bright illumination's ray
Has chased the darkness far away,
Heads filled with mathematics lore
Dispute if two and two make four.
Go on, ye scientific sages,
Collect your light a few more ages,
Perhaps as swells the vast amount
A century hence you'll learn to count."

December 10, 1900.

M. A. GRUBER.

133. Proposed by COOPER D. SCHMITT, A. M., Professor of Mathematics, University of Tennessee, Knoxville, Tennessee.

In Wentworth's Arithmetic he gives a formula $\frac{2}{3}(d^2 - 2d)$ for calculating the number of board feet in a log 10 feet long, when d is the diameter in inches. How is this rule derived?

No solution of this problem has been received.

135. Proposed by NELSON L. RORAY, Bridgeton, N. J.

If 6 is one-half of 10, what part of 20 is 12? Also what part of 30 is 10?

Solution by M. A. GRUBER, A. M., War Department, Washington, D. C.; MARTIN SPINKS, Wilmington, O.; P. S. BERG, B. S., Larimore, N. D.; G. B. M. ZERR, A. M., Ph. D., Philadelphia, Pa.; DANIEL B. NORTHPROP, Mandana, N. Y.

The general statement of this problem is, If a is nb , c is dx . What is the value of x ? $a:nb=c:dx$.

$$\therefore x = \frac{nbc}{ad}.$$

Substituting the numerical values, $x = \frac{\frac{1}{2} \times 10 \times 12}{6 \times 20} = \frac{1}{2}$.

\therefore 12 is one-half of 20, if, etc.

$$\text{Also } x = \frac{\frac{1}{2} \times 10 \times 10}{6 \times 30} = \frac{5}{18}.$$

\therefore 10 is $\frac{5}{18}$ of 30, if, etc.

PROOF. $\frac{1}{2}$ of 10 = 5; $\frac{1}{2}$ of 20 = 10; and $\frac{5}{18}$ of 30 = $8\frac{1}{2}$.

$6:5=12:10$; also, $6:5=10:8\frac{1}{2}$.